REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-4, 6-11, 14, and 16 are currently pending in the application. Claims 1-4, 6-11, 14, and 16 are amended; and Claims 5, 12-13, and 15 are canceled without prejudice by the present amendment. No new matter is added.[1]

In the outstanding Office Action, the Abstract was objected to as containing informalities; the specification was objected to as containing informalities; Claims 12-15 were rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter; Claims 1, 2, 4, 6, 8-11, and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jones et al. (U.S. Patent 7,099,510 B2, hereinafter "Jones"); Claims 3 and 5 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jones in view of Daly et al. (U.S. Patent 6,173,069 B1, herein "Daly"); and Claim 7 was rejected under 35 U.S.C. § 103(a) as unpatentable over Jones in view of Moghaddam et al. ("Probabilistic Visual Learning for Object Representation," IEEE Transactions on Pattern Analysis and Machine Intelligence, Vol. 19, No. 7, July 1997, p. 696-710, herein "Moghaddam").

Regarding the objection to the Abstract, the Abstract is deleted. A new Abstract is added. No new matter is added. Applicants respectfully request that the objection to the Abstract be withdrawn.

[1] Support for the amendment to Claims 1, 11, 14, and 16 is found at least in Claim 5 and in the specification from page 12, line 10 to page 14, line 25, and from page 28, line 1 to page 29, line 9.

Regarding the objection to the specification, Applicants have amended the specification to include section headings, as suggested by the Office Action. Applicants respectfully request that the objection to the specification be withdrawn.

Regarding the rejection of Claims 12-15 under 35 U.S.C. § 101, Applicants have canceled Claims 12-13 and 15. Thus, Applicants respectfully submit that the rejection of Claims 12-13 and 15 is moot. Additionally, Applicants have amended Claim 14 to recite a computer-readable medium, as suggested by the Office Action. Accordingly, Applicants submit that amended Claim 14 is directed to statutory subject matter. Applicants respectfully request that the rejection of Claims 12-15 under 35 U.S.C. § 101 be withdrawn.

In a non-limiting example, metadata may be used to define a classification of the image such as, for example, whether the image is part of footage of a football match or part of a news broadcast.

In another non-limiting example, detection of faces at different scales may be weighted in response to metadata so that faces of a desired size may be given an enhanced probability. This weighting may provide an elegant way of reducing processing resources necessary for face detection; only a subset of image scales may be searched rather than searching for faces at all possible scales. Furthermore, different metadata may be used for different programs, thus providing a flexible system which may be used in many different broadcast environments. Accordingly, Applicants respectfully submit that the applied references do not teach or suggest the means for modifying, as recited in amended Claim 1, the modifying recited in amended Claims 11 or 14, or the controller recited in amended Claim 16.

Claims 1, 11, and 16 were rejected under 35 U.S.C. § 103(a) as unpatentable over Jones. Claim 5 was rejected under 35 U.S.C. § 103(a) as unpatentable over Jones in view of Daly. Because Claims 1, 11, and 16 are amended to incorporate subject matter similar to that recited in Claim 5, Applicants assert the patentability of amended Claims 1, 11, and 16 in light of Jones and Daly.

Independent Claim 1 recites, in part, a face detection apparatus configured to generate an output indicating a likelihood of a region of an image containing a face. The apparatus includes

> means for comparing the region with face data that indicates a presence of the face and for detecting respective likelihood values indicating the likelihood of the region containing the face in a group of respective different face sizes; and
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> means for modifying at least one of the group and the likelihood values based on a face size or a range of face sizes appropriate to at least one classification of the image, the means for modifying being responsive to metadata associated with the image defining the at least one classification of the image, the image being a part of a video sequence and the at least one classification includes a video program type.

Independent Claims 11, 14, and 16, while directed to alternative embodiments, recite similar features. Accordingly, the remarks presented below are applicable to each of independent Claims 1, 11, 14, and 16.

Turning to the applied reference, Jones relates to a system and a method for improving a speed for detecting objects, such as faces, within images. In particular, Jones builds classifiers that indicate a presence of an object by using rectangular features.[2] Jones uses these rectangular features to detect simple features of an object such as a mouth and

[2] Id. at col. 7, lines 47-50.

cheeks.[3] Jones identifies each of these simple features by using a threshold function. Further to Jones, the threshold function is weighted in accordance with an importance of the simple feature in detecting the object.[4] Assuming *arguendo* that Jones discusses modifying likelihood values appropriate to a classification of an image, Jones does not teach or suggest modifying likelihood values ***based on a face size or a range of face sizes appropriate to a classification***. Thus, Applicants respectfully submit that Jones does not teach or suggest the means for comparing and for detecting respective likelihood values indicating a likelihood of a region containing a face in a group of respective different face sizes recited in amended Claim 1.

Jones states that determinations regarding whether an image contains a face yields important meta-information. Further to Jones, this meta-information insures that a face recognition system returns only images containing people. Assuming *arguendo* that Jones discusses meta-information that defines a classification of an image, Jones does not teach or suggest means for modifying being responsive to metadata associated with an image defining at least one classification of the image, as recited in amended Claim 1.

Furthermore, Jones describes that classification means classify a sub window as to whether it contains a face.[5] Applicants submit that Jones is silent regarding a video program type, such as a sports program or a news broadcast. Applicants respectfully submit that Jones does not teach or suggest that a classification includes a video program type, as recited in amended Claim 1.

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[3] Id. at col. 7, lines 50-59.
[4] Id. at col. 9, lines 11-20.
[5] Id. at col. 6, line 64 to col. 7, line 1.

Turning to Daly, that reference relates to a system for compressing data for portions of a video frame based on a location of a face within the video frame.[6] In particular, Daly relates to reducing coding artifacts in a video conferencing system.[7] Daly uses candidate circles to detect a top of a user's head after pixel differences between a current image and a previous image have been calculated.[8] According to Daly, the resultant candidate circles are weighted according to their size and position within the video frame.[9] In Daly, further face detection is only carried out on image regions corresponding to candidate circles having a sufficient score.[10] Daly's further face detection includes matching ellipses to an outline of a face and weighting the ellipses as to their size and position within the video frame.[11] Daly states that matched ellipses in a particular image region are more likely to correspond to a face.[12] Applicants submit that Daly is silent regarding metadata defining at least one classification of an image. Thus, Applicants respectfully submit that Daly does not teach or suggest ***means for modifying being responsive to metadata*** associated with an image defining at least one classification of the image, as recited in amended Claim 1.

Furthermore, Applicants submit that the subject matter with which Daly deals would not have logically commended itself to an inventor's attention in considering his invention as a whole. See M.P.E.P. § 2141.01(a). If a person having ordinary skill in the art were looking to increase the speed of the face detection of Jones, Applicants submit that the person is unlikely to turn to a document such as Daly. Daly merely offers a crude face detection

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[6] See Daly at Abstract and col. 1, lines 11-14.
[7] Id. at col. 5, lines 24-43.
[8] Id. at col. 6, lines 10-65.
[9] Id. at col. 7, line 40 to col. 8, line 15.
[10] Id. at col. 8, lines 16-19.
[11] Id. at col. 8, lines 45-53.
[12] Id.

method that may result in many false positives or false negatives, if a face outline does not conform to a circle or an ellipse. Applicants submit that it is therefore very unlikely that a person having ordinary skill in the art would think to combine Jones with Daly.

Additionally, the Daly face detection process of fitting curves to image shapes will not work well if a user's silhouette departs from a circle or an ellipse. Accordingly, Applicants submit that Daly does not teach or suggest means for comparing a region with face data that indicates a presence of a face and for detecting respective likelihood values indicating a likelihood of the region containing the face in a group of respective different face sizes, as recited in amended Claim 1.

Therefore, Applicants respectfully submit that Jones and Daly, taken alone or in combination, fail to teach or suggest the means for comparing or the means for modifying recited in amended Claim 1. Thus, Applicants respectfully submit that independent Claim 1 (and all associated dependent claims) patentably distinguishes over any proper combination of Jones and Daly.

Moreover, because no proper combination of Jones and Daly teaches or suggests the means for comparing recited in amended Claim 1, Applicants further submit that no proper combination of Jones and Daly teaches or suggests the comparing recited in amended Claim 11, the comparing recited in amended Claim 14, or the comparator recited in amended Claim 16. Similarly, because no proper combination of Jones and Daly teaches or suggests the means for modifying recited in amended Claim 1, Applicants further submit that no proper combination of Jones and Daly teaches or suggests the modifying recited in amended Claim 11, the modifying recited in amended Claim 14, or the controller recited in amended Claim

16. Hence, Applicants respectfully submit that independent Claims 11, 14, and 16 patentably distinguish over any proper combination of Jones and Daly.

Furthermore, Applicants submit that Moghaddam does not remedy the above-noted deficiencies in Jones and Daly. Applicants respectfully submit that the rejection of Claim 7 is therefore moot.

Moreover, Applicants respectfully submit that, should the Examiner wish to maintain the rejections, the next Office Action more thoroughly explain the rejection so that Applicants may fairly decide whether to further amend or to appeal.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that a new Abstract is submitted, the specification is amended as suggested by the Office Action, that the invention defined by Claim 14 is directed to statutory subject matter, and that the invention defined by Claims 1, 11, 14, and 16 patentably distinguishes over the applied references. The present application is believed to be in condition for formal allowance, and an early and favorable reconsideration of the application is therefore requested.

Respectfully submitted,

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